

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/084,055

REMARKS

Applicants thank the Examiner for acknowledging their claim to priority under 35 U.S.C. § 119, and receipt of a certified copy of the priority document.

Claims 1-4 are all the claims pending in the application.

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by USP 6,377,315 to Carr et al. Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Carr. Applicants respectfully traverse these rejections, and request reconsideration and allowance of the pending claims in view of the following arguments.

Claim 1 of the present application recites a multi-carrier receiver comprising an antenna selector to select at least two carriers as antennas for estimation of characteristics of a narrowband disturber, characterized in that the antenna selector is adapted to select said at least two antennas amongst all carriers located inside a predetermined frequency band wherein power spectral density of the multi-carrier signal has to stay below a threshold value, and at least two carriers located outside the predetermined frequency band.

The present application provides a multi-carrier receiver which is able to estimate the characteristics of a narrowband disturber in a standardized Radio Frequency Interference (RFI) band accurately. Fig. 2 of the present application is a frequency diagram illustrating the operation of the prior art multi-carrier receiver when an RFI disturber RFI-Signal-2 is near an edge of the RFI band. The prior art receiver has to select one antenna A21 (a reserved carrier out of the set of carriers constituting a discrete multi tone (DMT) signal (Specification, page 2, lines 3-6)) close to the narrowband disturber RFI-Signal-2, or has to select two antennas on one side

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of the narrowband disturber RFI-Signal-2, and could not accurately estimate and compensate for the RFI disturber RFI-Signal-2. Fig. 3 is a frequency diagram illustrating the operation of a multi-carrier receiver according to one embodiment of the present application. As shown, apart from the carriers having frequencies in the RFI-band, two additional carriers C1 and C2 are kept zero. If a narrowband disturber RFI-signal-3 is located near the lower edge of the RFI-band, the multi-carrier receiver of the present application selects carrier C1, out of the RFI-band, as the first antenna and another carrier A32, inside the RFI-band, as the second antenna for estimating the characteristics of the narrowband disturber RFI-Signal-3.

However, Carr discloses an integrated receiver with channel selection and image rejection. The purpose of Carr is to integrate all channel selectivity and image rejection of a tuner architecture onto a single silicon substrate. The receiver of Carr could be incorporated into a set top box shown in Fig. 55, a television shown in Fig. 56, a VCR shown in Fig. 57 or a cable modem shown in Fig. 58.

Fig. 48 of Carr shows a receiver. As shown, a received signal 1906 in the 50-860 MHz range is up converted by a first mixer 1916 and a first local oscillator (LO) 1908 to a first IF 1918 of 1,200 MHz. The first IF 1918 is then filtered by a first bank of 3 LC band pass filters 1912. The output of the first filter bank 1912 is then down converted by a second mixer 4802 and a second LO 1904 to a second IF 1922 of 275 MHz. The second IF 1922 is then filtered by a second filter bank 1934. The filter banks 1912 and 1934 provide 30-35 dB_C image rejection and the complex mixer 4802 provides an additional image rejection. A third mixer 4806 and a third filter bank 1936 achieve 25 dB and 40 dB of image rejection respectfully.

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Thus, Carr talks about tuning the receiver to receive desired signals, converting received signals into a first IF signal, then to a second IF signal, and then to a third IF signal, and providing image rejection. There is nothing in Carr about selecting at least two carriers for estimation of characteristics of a narrowband disturber.

The Examiner has asserted that Carr teaches that multi-carrier signals inside a predetermined frequency band can be selected at the radio receiver via selection process of antenna(s) of a dual conversion receiver, referring to Figs. 1 and 5; col. 5, lines 22-42; col. 7, lines 39-49; col. 7, line 62 to col. 8, line 25; and col. 11, line 54 to col. 12, line 27 of Carr.

It appears that the Examiner corresponds the recited antenna to an antenna of a dual conversion receiver in Carr. However, antennas in claim 1 are carriers, but the antenna in Carr is an element of the receiver.

It also appears that, in the Examiner's opinion, the received signals in Carr correspond the recited multi-carrier signals, and the band of signals that can be received by a receiver corresponds to the recited predetermined frequency band.

The Examiner has further asserted that Carr teaches that at least two carriers are outside the predetermined frequency band, referring to Fig. 4, and col. 11, lines 10-53 of Carr. Applicants disagree. In Fig. 4 of Carr, inputs of two frequencies 404 and 406 to a radio receiver will yield a signal at an IF frequency 408. A frequency 402 is an image frequency. However, the image frequency 402 could be detected by the receiver and needs to be suppressed (Carr, col. 11, lines 13-18). Thus, the image frequency 402 is not located outside the band of signals that the receiver can receive. Accordingly, even if the band of signals that can be received by a

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receiver corresponds to the recited predetermined frequency band, as the Examiner has asserted, Carr fails to teach or suggest the recited at least two carriers located outside the predetermined frequency band.

Accordingly, Applicants respectfully submit that claim 1 and its dependent claims 2-4 are patentable.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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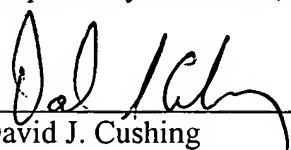
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